Match & Return

PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Shunji ARAKI, et al.

Appln. No.: 08/934,396 Group Art Unit: 1713

Filed: September 19, 1997 Examiner: F. Zitomer

For: RUBBER COMPOSITION AND PNEUMATIC TIRE USING SAID RUBBER COMPOSITION

REQUEST FOR RETURN OF EXPUNGED DOCUMENTS

BOX ISSUE FEE
Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In a Decision on Petition dated February 16, 2000, the Examiner granted Applicants' Petition to Expunge information contained in the Proprietary Information Disclosure Statement filed on October 1, 1998.

The Decision on Petition states that the confidential information was returned with the Decision. However, the expunged material was not enclosed with the Decision on Petition.

In light of the grant of petition, Applicants request that the information contained in the Proprietary Information Disclosure Statement filed on October 1, 1998 be expunged from the file and returned to Applicants pursuant to 37 C.F.R. §1.59 and MPEP §724.

Respectfully submitted,

Lee C. Wright
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Date: March 21, 2000

mailed 6/21/00

1733

PATENT APPLICATION
Attorney Docket No. Q52755

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Tomohisa NISHIKAWA, et al

Appln. No.: 09/217,568 Group Art Unit: 1733

Filed: December 21, 1998 Examiner: A. JOHNSTONE

For: PNEUMATIC TIRE FOR PASSENGER CARS WITH SIDEWALL PORTIONS HAVING A RUBBER REINFORCING LAYER AND A RUBBER-FILAMENT FIBER COMPOSITE (AS AMENDED HEREIN)

AMENDMENT UNDER 37 C.F.R. § 1.111

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action dated December 21, 1999, please amend the above-identified application as follows:

IN THE SPECIFICATION:

Page 1,	line 5,	delete "shows" and insert --has--;
	line 12,	delete "for" and insert --as--;
	line 23,	delete "shows" and insert --exhibits--;
	line 24,	delete "shows" and insert --has--.
Page 2,	line 9,	delete "shows" and insert --exhibits--.
Page 3,	line 1,	delete "present";
	line 11,	delete "from layer";
	line 13,	delete "portion" and insert --layer--;
	line 22,	after "in", insert --each of--;
	line 24,	delete "DSC" and insert --differential scanning calorimetry (DSC)--.

Page 6,	line 13,	delete "DSC" and insert --differential scanning calorimetry (DSC)--;
	line 17,	delete "a stabilizer" and insert --one--.
Page 7,	line 23,	delete "is" and insert --,--;
	line 25,	delete "is" and insert --,--.
Page 8,	line 11,	delete "be able to".
Page 9,	line 5,	delete "and such" and insert --. Such--.
Page 10,	line 18,	delete "the" (second occurrence).
Page 11,	line 3,	delete "As for the" and insert --The--;
	line 4,	delete "it is preferable" and insert --preferably are--.
Page 16,	line 26,	delete "For the" and insert --The--;
		delete "," and insert --may use--.
Page 20,	line 1,	after "shown", insert --by this invention--.

IN THE CLAIMS:

Please amend the claims as follows:

1. (Amended) A pneumatic tire for passenger cars comprising:

a pair of left and right ring-shaped bead cores;

a carcass layer [formed from a layer] in which a plurality of reinforcing cords disposed substantially parallel to each other are embedded in a covering rubber;

a tread portion disposed at an outer side of said carcass [portion] layer in the radial direction of the tire; and

a pair of side wall portions disposed at the left and right of said tread portion;

wherein a rubber reinforcing layer having a crescent-shaped cross-section and at least one sheet of a rubber-filament fiber composite having a thickness of 0.05 to 2.0 mm which is formed from a

rubber component and filament fibers having a diameter or a maximum cross-sectional dimension of 0.0001 to 0.1 mm and a length of 8 mm or more are disposed in each of said side wall portions; and

said reinforcing [cords of] carcass [plies] cords are made of an aliphatic polyamide fiber having a melting point of 250°C or higher as measured by [DSC] differential scanning calorimetry.

Claim 7, line 1, before "cords", insert --carcass--;

line 2 delete "of carcass plies".

IN THE ABSTRACT:

Line 2, delete "The present invention provides a" and insert --A--.

Line 3, delete "comprising" and insert --comprises--.

Line 9, delete "and" (second occurrence) and insert --.--.

Line 10, delete "reinforcing" and insert --Reinforcing--.

Line 11, delete "Deterioration of adhesion in".

Lines 12-13, delete in their entirety.

REMARKS

This response follows an Office Action of December 21, 1999. It is believed that by this response the application is now in a condition for allowance. There are no prior art rejections to claims 1-7.

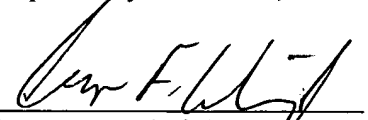
The Applicant notes with appreciation that the Examiner has acknowledged receipt of the priority document under 35 U.S.C. § 119. The specification has been reviewed and revised and grammatical changes have been made as required. Included in those changes is the change to the title as required by the Examiner and appropriate amendments to the Abstract of the Disclosure.

Applicant attaches herewith another copy of EP 613795 A1, which was originally filed on November 12, 1999. Upon review of the reference, it was noted that no drawing was attached to the EP reference. This reference was obtained from an online service and there is no reason to believe that the reference is missing any pages. Therefore, Applicant requests that the reference be considered and included on the face of any patent granted because as noted above no drawing sheet is attached and should thus have been considered when originally filed.

Claims 1 and 7 have been amended as required by the Examiner in paragraph 8. Based on this response all issues raised by the Examiner have been dealt with and the Application should now be in a condition for allowance. Should the Examiner have any questions, she is requested to contact the undersigned attorney of record at the local exchange listed below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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Date Filed: March 21, 2000

(19) Europäisches Patentamt
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(21) Application number : **94301501.6**

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(84) Designated Contracting States :
DE FR GB

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(54) Run-flat safety tyre.

(57) A pneumatic tyre comprising a tread portion (1), a pair of axially spaced bead portions (2), a pair of sidewalls (3) extending between the edges of the tread and the bead portions (2), a pair of bead cores (4) disposed one in each bead portion (2), a carcass (5) extending between the bead portions (2) through the sidewalls (3) and tread portion (1) and a belt (6) disposed radially outside the carcass (5) extending across the tread portion (1), wherein each sidewall is provided axially inside the carcass (5) with a liner packing piece (7) extending radially inwardly to the bead portion (2) and radially outwardly into the tread region (1) characterised in that the packing piece comprises a fibre-reinforced rubber composition containing aramid fibres in the form of short discontinuous fibrillated fibres.

EP 0 613 795 A1

This invention relates to pneumatic tyres and in particular to run-flat safety tyres.

In the conventional pneumatic tyre the tyre carcass is tensioned by the internal inflation pressure thus providing sufficient rigidity in the tyre sidewall to enable the tyre to carry load. If the internal pressure is lost for any reason then the carcass tension and thus the sidewall rigidity is lost and the sidewall experiences severe deflection which rapidly generates a large amount of heat. Additionally the tyre sidewalls may collapse completely such that the upper and lower internal surfaces contact and the differential slip between these generates frictional heat further adding to the temperature rise of the tyre. Thus in a very short time the high temperature generated degrades the material of the carcass and the tyre is destroyed. Accordingly the conventional pneumatic tyre has no practical run-flat capability.

In order to provide run-flat performance for a pneumatic tyre various structures have been proposed. For example in the inner chamber formed by the tyre and wheelrim assembly an elastic member or an inflatable structure to form an independent air chamber have been proposed to provide load support in the event of tyre deflation.

Such structure however have not found utility in the modern tyre because the weight of the tyre and wheelrim assembly is greatly increased whereby high speed performance is significantly reduced.

Alternatively it has been proposed to improve the load bearing ability of the tyre sidewall under deflated conditions by increasing the thickness of the sidewall thereby increasing its rigidity. Although the run-flat capability of such tyres is improved their performance is limited due to the nature of conventional rubber compounds. Accordingly the necessary sidewall thickness to provide full load support is such that normal flexing as the sidewall passes through the contact patch generates heat which due to the poor conductivity of rubber is retained in the bulk of the sidewall. Thus in run-flat use the tyre is limited in maximum speed and range such that the tyre does not overheat.

The object of the present invention is therefore to provide a pneumatic tyre which is improved in run-flat performance without sacrificing high speed running or range.

According to one aspect of the present invention a pneumatic tyre comprises a tread portion, a pair of axially spaced bead portions, a pair of sidewalls extending between the edges of the tread and the bead portions, a pair of bead cores disposed one in each bead portion, a carcass extending between the bead portions through the sidewalls and tread portion and a belt disposed radially outside the carcass extending across the tread portion, wherein each sidewall is provided axially inside the carcass with a liner packing piece extending radially inwardly to the bead portion and radially outwardly into the tread region which comprises a fibre-reinforced rubber composition containing aramid fibres in the form of short discontinuous fibrillated fibres.

Preferably the aramid fibres are orientated at 0°-20° to the radial direction of the tyre. More preferably the fibres are orientated at less than 5° to the radial direction. Also preferably the aramid fibres are 0.2 to 5mm long. They may also or alternatively be 2-20 microns thick. Their surface area may also be in the range of 4 to 20 m^2/gram. Preferably the fibres are present in the rubber composition in a quantity in the range of 2-20 parts per hundred parts by weight of rubber. Most preferably the fibres are present in the range 8 to 12 parts per hundred of rubber.

Further aspects of the present invention will become apparent from the following description by way of example only of one embodiment in conjunction with the accompanying drawing in which:

Figure 1 is a schematic cross-sectional view of one half of a tyre according of the present invention.

Figure 1 shows a pneumatic safety tyre according to the present invention for high speed use. The tyre size is 225/55VR16 and is designed for vehicles capable of speeds in excess of 210Km/h.

The tyre comprises a tread portion 1, a pair of axially spaced bead portions 2, a pair of sidewalls 3 extending between the edges of the tread and the bead portions, a toroidal carcass 5 extending between the bead portions 2 and turned up around bead cores 4 located one in each bead region 2 from the axial inside to the outside and a belt 6 disposed radially outside the carcass 5 and inside the tread.

The tyre had an aspect ratio, defined as the ratio H/2xW of the tyre section height H to the maximum section width 2xW, of 0.55.

The carcass 5 comprises one ply of cords arranged radially at an angle of 70 to 90 degrees. In this embodiment the carcass cords are polyester but other organic fibres cords such as nylon, rayon, aramid or the like or steel may be used.

The belt 6 comprises a breaker comprising plies 6B and 6C and a bandage Belt 6A. Each of the belt plies 6B and 6C is composed of parallel cords laid at a small angle with respect to the tyre equator and arranged to cross each other. For the breaker belt cords steel cords or high modulus organic cords may be used.

The bandage belt comprises parallel cords substantially at 0° to the tyre equator. For the cords of the bandage belt 6A organic fibre cords such as rayon, nylon or polyester or the like may be used.

In each of the sidewall portions 3 a liner packing piece 7 is disposed inside the carcass 5 and outside the air-retaining inner liner 8. The liner packing piece 7 is tapered in section towards its radially inner and outer

extremities. The radially inner extremity extends into the bead region 2 and is terminated radially outward of the bead core 4. The radially outer extremity of the liner packing piece 7 extends into the tread portion 1 and terminates beneath the axially outer portion of the belt 6.

The liner packing piece 7 comprises a fibre reinforced rubber composition containing 2 to 20 parts by weight of short reinforcing fibres per 100 parts by weight of rubber. The short fibres are made of aramid material which has been fibrillated to produce a pulp having a high surface area. The fibres have a length in the range 0.2 to 5mm, a cross-sectional diameter in the range of 2-20 microns and an available surface in the range 4-20 m^2/g.

The short reinforcing fibres are orientated substantially in the radial direction of the tyre.

Test tyres of size and structure according to Figure 1 were prepared and tested for run-flat performance. Example tyres according to the present invention incorporated a liner packing piece comprising rubber composition A of Table 1, containing 10 parts by weight per hundred of rubber of KEVLAR aramid pulp (KEVLAR is a Registered Trade Mark of E I Du Pont de Nemours). The KEVLAR pulp was incorporated in the composition in the form of a masterbatch of 44.4% weight of pulp, 44.4% weight carbon black and 11.2% natural rubber.

The fibre-containing composition was processed by known techniques to orientate the fibres in one direction and the tyres assembled with the fibres orientated radially in the tyre. Comparative tyres were also prepared having a liner packing piece of a conventional rubber compound, composition B of Table 1.

These two types of tyres were tested on a Jaguar XJ6 vehicle under a load of 490Kg per tyre. The tyres were run on a normal road surface at zero pressure (inflation valve core removed) at a constant speed of 60Km/h in conditions that were 80% dry. The comparative tyres containing the liner packing piece of a conventional rubber compound ran under these conditions for a distance of 16Km before failing due to overheating. The tyres according to the present invention incorporating the fibre reinforced liner packing piece travelled a distance of 185Km before the test was stopped.

TABLE 1

COMPOSITION A

INGREDIENT	PPHR
Aramid fibre masterbatch*	22.50
Styrene butadiene rubber	17.6
Isoprene rubber	79.9
N326 carbon black	39.0
Zinc oxide	4.0
Stearic acid	2.5
Aromatic oil	9.3
HMT/EVA (80/20)	1.15
Accelerator	1.16
Sulphur	2.6

*Masterbatch of 44.4% KEVLAR fibre pulp
44.4% carbon black
11.2% natural rubber

COMPOSITION B

INGREDIENT	PPHR
Isoprene rubber	100.0
N375 carbon black	74.0
Zinc oxide	4.0
Stearic acid	2.0
Reinforcing resin	25.0
Aromatic oil	7.0
HMT/EVA (80/20)	2.23
Accelerator	0.25
Sulphur	4.0

Claims

1. A pneumatic tyre comprising a tread portion (1), a pair of axially spaced bead portions (2), a pair of sidewalls (3) extending between the edges of the tread and the bead portions (2), a pair of bead cores (4) disposed one in each bead portion (2), a carcass (5) extending between the bead portions (2) through the sidewalls (3) and tread portion (1) and a belt (6) disposed radially outside the carcass (5) extending across the tread portion (1), wherein each sidewall is provided axially inside the carcass (5) with a liner packing piece (7) extending radially inwardly to the bead portion (2) and radially outwardly into the tread region (1) characterised in that the packing piece comprises a fibre-reinforced rubber composition containing aramid fibres in the form of short discontinuous fibrillated fibres.

2. A tyre according to claim 1 characterised in that the aramid fibres have a length in the range 0.2 to 5mm.

3. A tyre according to claim 1 or 2 characterised in that the aramid fibres have a cross-sectional diameter in the range 2-20 microns.

4. A tyre according to claims 1 to 3 characterised in that the aramid fibres have a surface area of 4 to 20 m^2/g.

5. A tyre according to any of claims 1 to 4 characterised in that the aramid fibres are aligned lengthwise at 0-20° to the radial direction of the tyre.

6. A tyre according to any of claims 1 to 4 characterised in that the aramid fibres are aligned lengthwise at less than 5° to the radial direction of the tyre.

7. A tyre according to any of claims 1 to 6 characterised in that the aramid fibres are present in the rubber composition of the liner packing piece in an amount of 2-20 parts per one hundred parts of rubber by weight.

8. A tyre according to any of claims 1 to 7 characterised in that the aramid fibres are present in the rubber composition of the liner packing piece in an amount of 8-12 parts per hundred parts by weight of rubber.

9. A tyre according to any of claims 1 to 8 characterised in that the rubber composition comprises 10 to 50 parts by weight of styrene butadiene rubber per 100 parts by weight of rubber.

10. A tyre according to any of claims 1 to 9 characterised in that the rubber composition comprises 50 to 100 parts by weight of Isoprene rubber per 100 parts by weight of rubber.

11. A tyre according to any of claims 1 to 10 characterised in that the rubber composition comprises 20 to 50 parts of butadiene rubber per 100 parts by weight of rubber.

12. A tyre according to any of claims 1 to 11 characterised in that the rubber composition comprises 30 to 60 parts by weight of carbon black per 100 parts by weight of rubber.

13. A tyre according to claim 12 characterised in that the carbon black is one or more selected from the group comprising ASTM Ref. N326, N375 and N220.

European Patent Office

EUROPEAN SEARCH REPORT

Application Number
EP 94 30 1501

DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication, where appropriate, of relevant passages	Relevant to claim	CLASSIFICATION OF THE APPLICATION (Int.Cl.5)
A	EP-A-0 385 192 (PIRELLI SPA.) * claims; figures *	1	B60C13/00 B60C17/00
A	PATENT ABSTRACTS OF JAPAN vol. 4, no. 169 (M-43)21 November 1980 & JP-A-55 119 508 (BRIDGESTONE CORP.) 13 September 1980 * abstract *	1	
A	DATABASE WPI Week 9031, Derwent Publications Ltd., London, GB; AN 90-234857 & JP-A-2 162 101 (YOKOHAMA TIRE&RUBBER CO LTD.) 21 June 1990 * abstract *	1	

TECHNICAL FIELDS SEARCHED (Int.Cl.5)

B60C

The present search report has been drawn up for all claims

Place of search	Date of completion of the search	Examiner
THE HAGUE	20 May 1994	Baradat, J-L

CATEGORY OF CITED DOCUMENTS

X : particularly relevant if taken alone
Y : particularly relevant if combined with another document of the same category
A : technological background
O : non-written disclosure
P : intermediate document

T : theory or principle underlying the invention
E : earlier patent document, but published on, or after the filing date
D : document cited in the application
L : document cited for other reasons

& : member of the same patent family, corresponding document

EPO FORM 1503 03.82 (P04C01)

2721

Q46884
PATENT APPLICATION

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Yong-hun CHO

Appln. No.: 08/961,944 Group Art Unit: 2721

Filed: October 31, 1997 Examiner: G. DESIRE

For: IMAGE FORMAT CONVERTING METHOD AND APPARATUS

REQUEST FOR RECONSIDERATION UNDER 37 C.F.R. § 1.111

Assistant Commissioner for Patents
Washington, D.C. 20231

Sir:

In response to the Office Action dated December 21, 2000, please consider the following remarks:

REMARKS

Claims 1-12 are pending in the application. Claims 1-12 presently stand rejected.

The Examiner's objection in view of introducing new matter into the disclosure 35 U.S.C. § 132 has been withdrawn.

Claims 1-12 are rejected under 35 U.S.C. § 103(a) as being unpatentable (obvious) over Fu et al. (U.S. Pat. No. 5,703,965) in view of Reed et al. (U.S. Pat. No. 4,822,456). The rejections of claims 1-12 are respectfully traversed in view of the following remarks.

Applicant strongly believes that the Examiner misunderstands the inventive features of the present invention and has misapplied the cited references. Applicant strongly disagrees with the Examiner's arguments and characterizations of the present invention and the prior art

references, and Applicant notes a lack of motivation in the prior art references to combine and modify the limited disclosures of the prior art in the manner suggested by the Examiner.

Regarding the rejection of claims 1 and 7, Applicant notes that the Examiner admits that Fu et al. is silent with respect to filter characteristics of the pre-filter that compensate for operational effects of the format converter, wherein the operational effects comprise at least one of attenuation and aliasing caused by enlarging or reducing the input image. Applicant agrees with this admission. However, Applicant also notes that the Examiner interprets Col. 4, lines 15-22 of Reed et al. as teaching "filter characteristics of the pre-filter compensate for operational effects of the format converter, wherein the operational effects comprise at least one of attenuation and aliasing caused by enlarging or reducing the input image." Applicant disagrees with this interpretation, mainly because the format converter, as claimed in claims 1 and 7, is a bi-linear interpolating format converter, whereas the convolution or decimation filter 1012 of Reed et al. merely compensates for the effects of the **decimation process**. In fact, Reed et al. discloses and teaches only that "one skilled in the art will appreciate that image data X must be filtered in conjunction with **decimation** to avoid aliasing" (Col. 4, lines 15-17). Applicant notes that decimation is not equivalent to bi-linear interpolation. Therefore, Reed et al. cannot reasonably be interpreted as overcoming the deficiencies of Fu et al. because the convolution or decimation filter 1012 does not compensate for the operational effects of the format converter, wherein the function of the format converter is defined as **bi-linearly interpolation** of the pre-filtered signal, as recited in claims 1 and 7.

In summary, Applicant respectfully submits that the filters disclosed in Fu et al. and in Reed et al. compensate only for effects of the **decimation** process. In this regard, the Examiner's attention is directed to the specification of Fu et al. at Col. 24, line 21 to Col. 26, line 21 (and the specification of Reed et al. at Col. 4, lines 10-45).

Accordingly, Applicant notes that neither reference, alone or in combination with each other, discloses or suggests all of the claim limitations recited in either of independent claims 1 and 7. Specifically, none of the references, alone or in combination, discloses or suggests a pre-filter for pre-filtering the input image and for outputting a pre-filtered signal, and **a format converter for bi-linear-interpolating the pre-filtered signal, wherein filter characteristics of the pre-filter compensate for operational effects of the format converter**, and wherein the operational effects comprise at least one of attenuation and aliasing caused by enlarging or reducing the input image, as recited in claim 1. Likewise, none of the references, alone or in combination, discloses or suggests the steps of **setting filter characteristics of a pre-filter to compensate for operational effects of a format converter**, wherein the operational effects comprise at least one of attenuation and aliasing caused by enlarging or reducing the input image, pre-filtering the input image to output a pre-filtered signal, and **bi-linear-interpolating the pre-filtered signal**, according to a predetermined aspect ratio, to output a format-converted signal. Therefore, neither Fu et al. nor Reed et al., alone or in combination, renders either of independent claims 1 and 7 unpatentable.

In view of the foregoing, Applicant submits that independent claims 1 and 7 are patentable over the two references, alone or in combination with each other. Moreover,

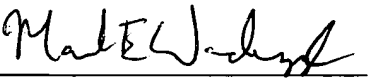
Applicant submits that claims 2-6, which depend from claim 1, are patentable at least for the reasons set forth above with respect to parent claim 1. Applicant also submits that claims 8-12, which depend from claim 7, are patentable at least for the reasons set forth above with respect to parent claim 7. Of course, dependent claims 2-6 and 8-12 are additionally patentable because of the limitations they add to their respective parent claims.

Accordingly, Applicant submits that claims 1-12 are patentable and that this application is now in condition for allowance. It is therefore respectfully requested that the Examiner reconsider the application and that the application be passed to issue.

If any points remain at issue which the Examiner feels may be best resolved through a personal or telephone interview, he is kindly requested to contact the undersigned at the local exchange number listed below.

Applicant hereby petitions for any extension of time which may be required to maintain the pendency of this case, and any required fee, except for the Issue Fee, for such extension is to be charged to Deposit Account No. 19-4880.

Respectfully submitted,



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Date: March 21, 2000